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Operational Testing Overview

April 2009

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FOUO **Outline**

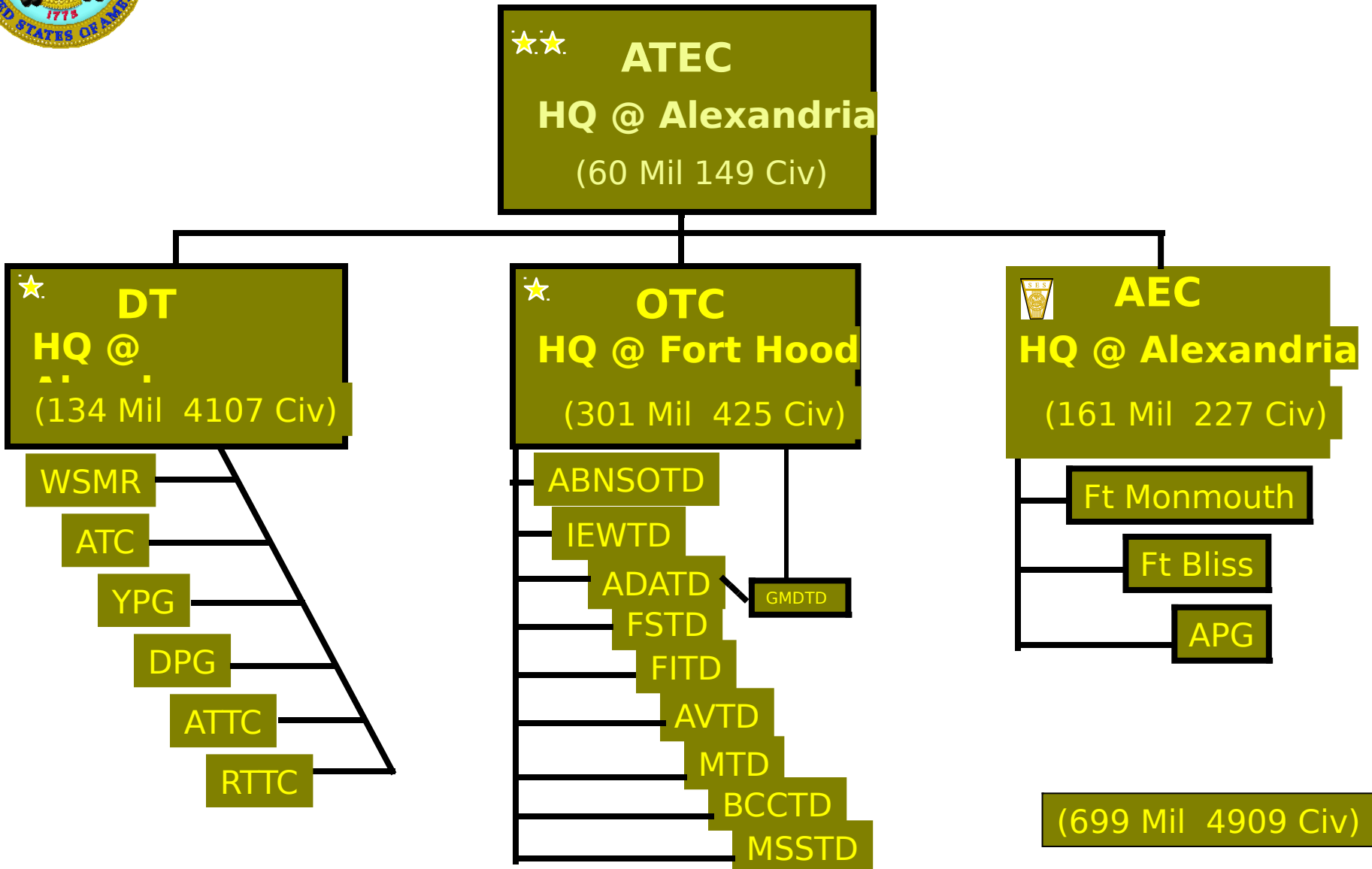
- **Army Test and Evaluation Command (ATEC)**
- **Operational Test Command (OTC)**
- **Why do operational tests**
- **Types of operational tests**
- **OT Entrance Criteria Templates**
- **Test planning, execution, and reporting**
- **OT&E Lessons learned**
- **Summary**

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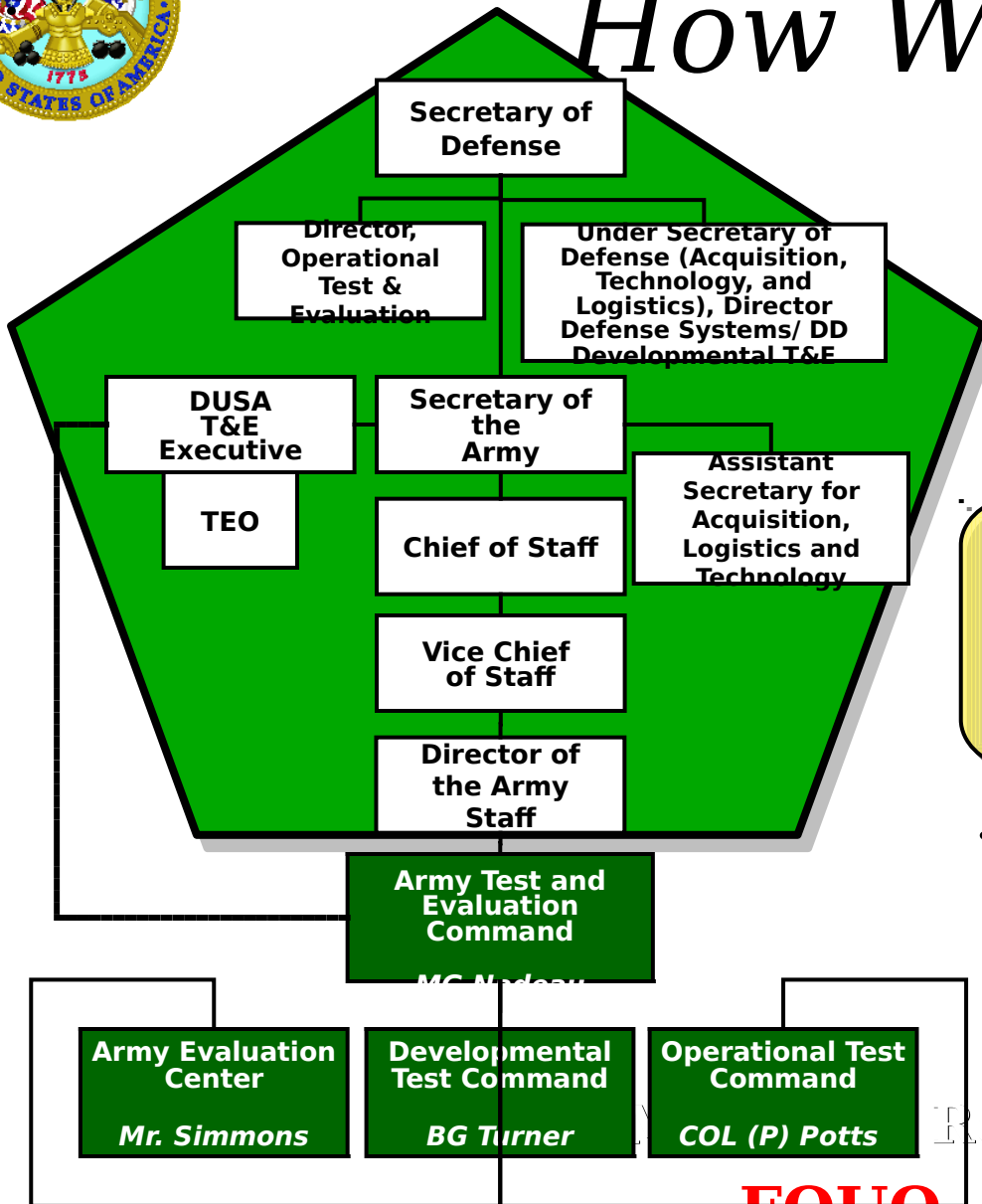
ARMY TEST and EVALUATION COMMAND (ATEC)





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How We Fit



**Independent
Reporting
Mandated by US
Code,
OMB, and OSD**

Legend

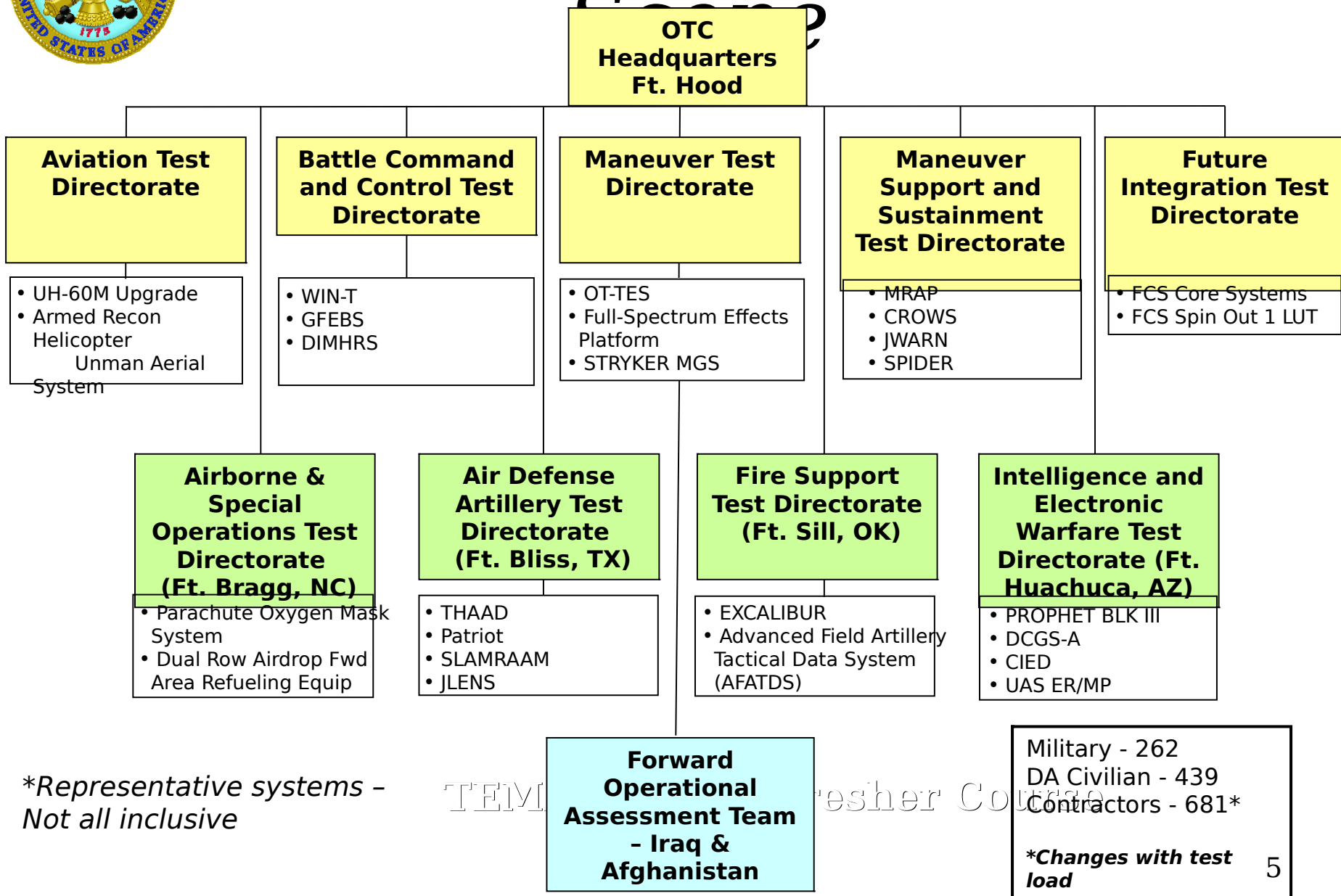
—— T&E Policy and Oversight

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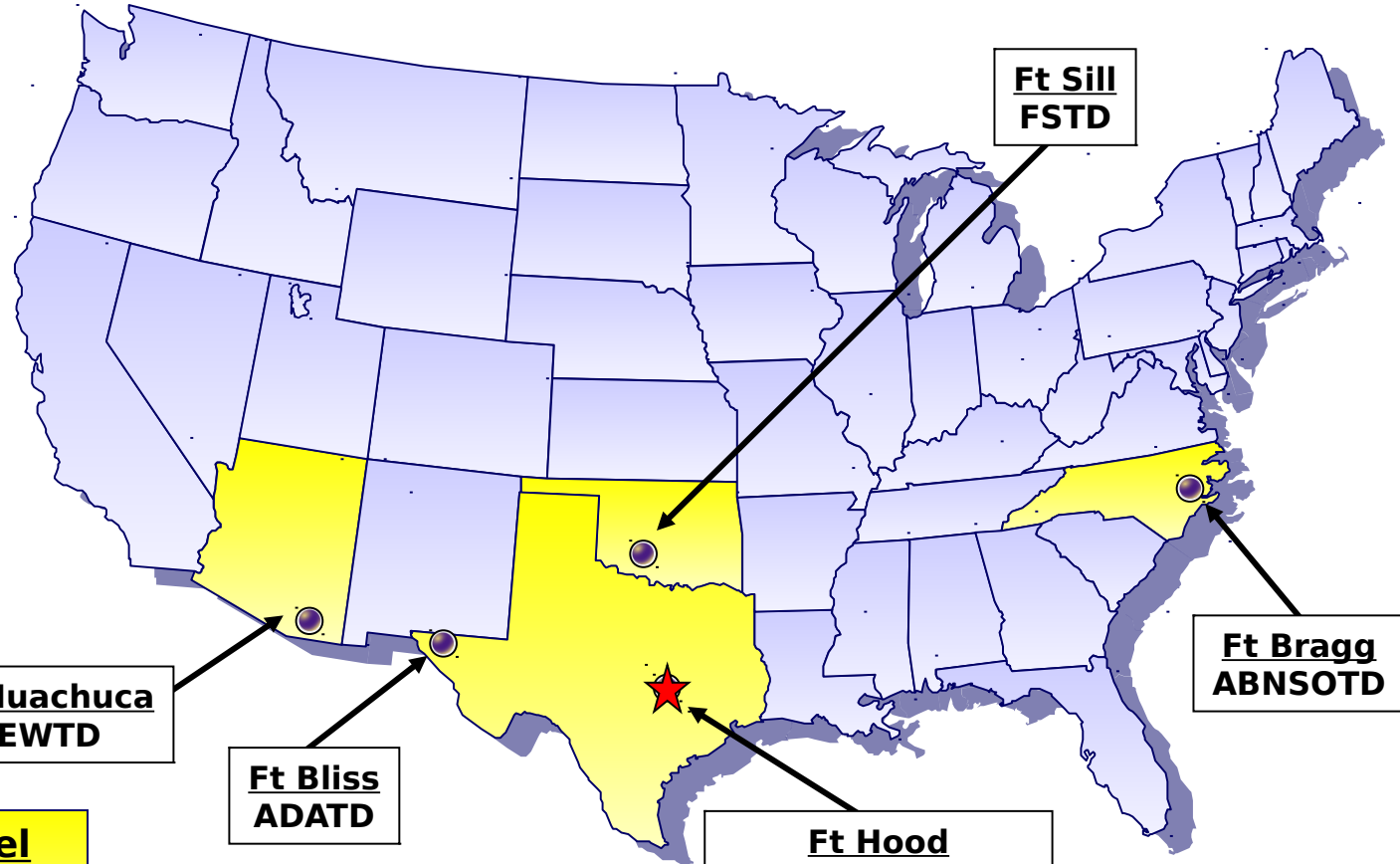


Organization & Equip





FOUO *OTC Locations*



**Ft Huachuca
IEWTD**

**Ft Bliss
ADATD**

**Ft Sill
FSTD**

**Ft Bragg
ABNSOTD**

**Ft Hood
HQ OTC**

**MSSTD
MTD**

**AVTD
BCCTD**

Personnel
301 Military
425 Civilian
565
Contractor

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Operational Test Command (OTC)

- **Plans, conducts, and reports results of Independent Operational Tests, Experiments, and Assessments of Army materiel and Information Mission Area systems**
- **Plans and conducts joint and multi-service tests**
- **Plans, conducts, and reports results of Force Development Tests in support of the Joint Capabilities Integration and Development System.**
- **Performs field experiments and participates in technology demonstrations in support of the technology base**

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Why Do Operational Tests?

A. U.S. Code 10, Section 2399:

- A major defense acquisition program (MDAP) * may not proceed beyond Low-Rate Initial Production (LRIP) until IOT&E is complete.
- OT&E does not include an operational assessment based exclusively on:
 - : Computer modeling
 - : Simulation; or
 - : an analysis of system requirements, engineering proposals, design specifications, or any other information contained in program documents
- Waiver not stated in the law

B. DA Pamphlet 73-1: The structuring and execution of an effective OT program is absolutely essential to the acquisition and fielding of Army systems that are operationally effective, suitable, and survivable while meeting user's requirements.

* ACAT I & II

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FOUO Operational Test Objectives

DOES THE SYSTEM WORK?

CAN THE SOLDIER USE IT?

IS IT SUPPORTABLE?

IS IT SURVIVABLE?

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Testing in Operational Environment

- **Production or production-representative system(s)**
- **Used typical military users integral units or elements for command and control**
- **Maintenance support elements and procedures as when fielded**
- **OPTEMPO based on OMS/MP**
- **Approved combat (and peacetime) scenarios against postulated threat**



FOUO Principles Of Operational Testing

- **Start early, use windows of opportunity, and apply continuous**
- **Plan based on multiple inputs from:**
 - **user**
 - **System evaluator**
 - **threat proponent**
 - **materiel developer**
 - **combat/training developers**
- **Maintain independence of testers and evaluators**
- **Do not test until ready - event driven process**
- **Minimize effects of operational testing on units**
- **Use typical troops, realistic scenarios, logistics support and**
- **Test and train simultaneously; use FUE for test**

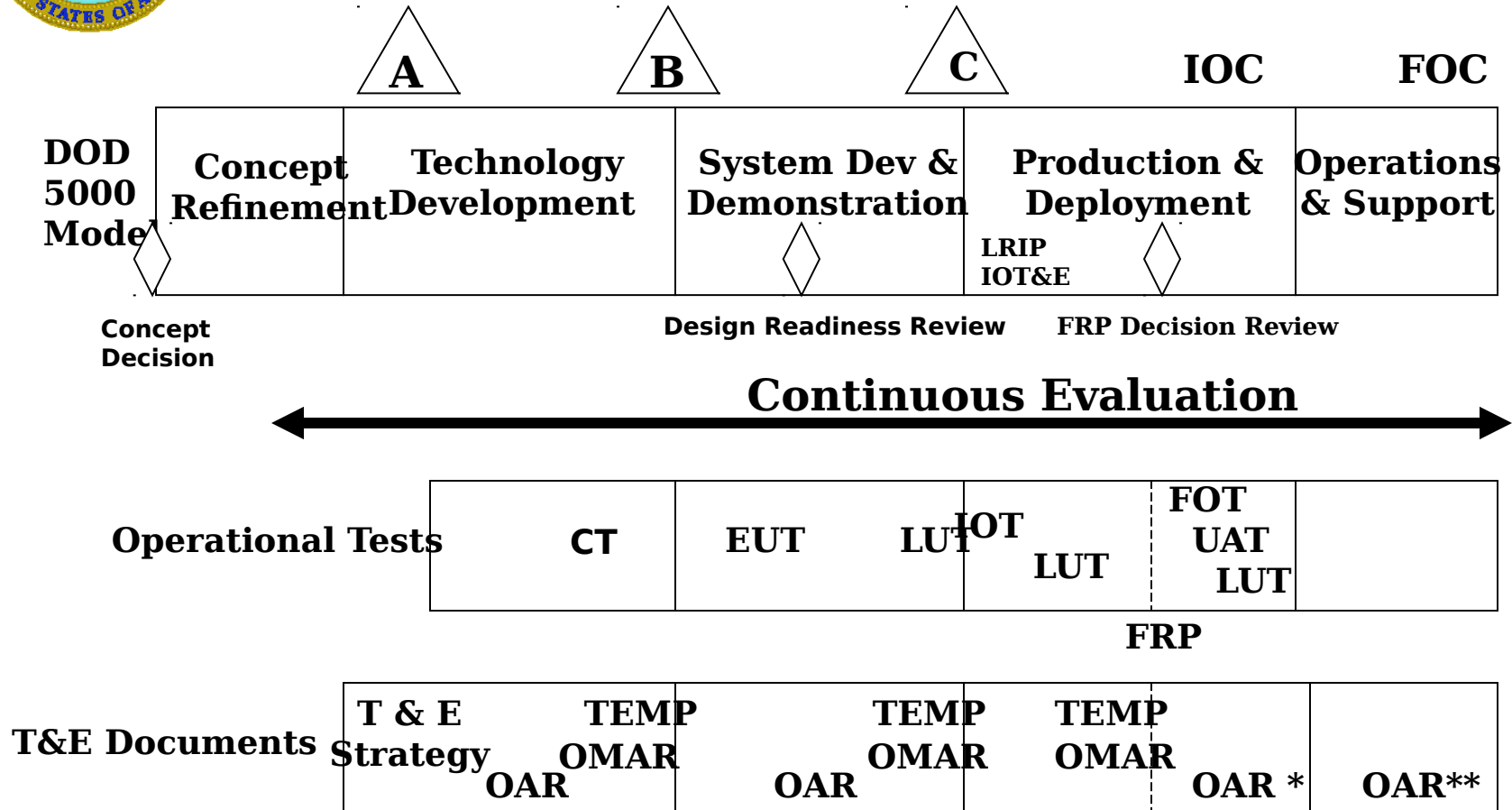
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OT in the Acquisition Cycle



Test Reports provided at completion of each test to acquisition and user communities

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* In support of materiel release process

** In support of Post Deployment Performance Evaluation

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Types of Operational Tests (O

- **Early User Test (EUT)**
- **Limited User Test (LUT)**
- **Initial Operational Test (IOT)**
- **Follow-on Operational Test (FOT)**
- **Other evaluation/assessment data sources:**
 - ✓ **Force Development Test or Experiment (FDT/E)**
 - ✓ **Customer Test (CT)**
- **Other Service Testing**
- **Expeditionary Testing**
- **Forward Operational Assessments**

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Early User Test (EUT)

Tests or experiments employing user troops for testing of concepts, support planning, identification of interoperability problems or future testing requirements to provide data for Operational Milestone Assessment Reports

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FOUO **Limited User Test** **(LUT)**

- **Normally conducted after MS B under operational conditions.**
- **Typically addresses a subset of system issues.**
- **Used to:**
 - ✓ **Supplement developmental testing prior to a**
decision to purchase long lead or LRIP items for IOT
 - ✓ **Verify a fix to a problem found in IOT that must be**
corrected prior to production
 - ✓ **Support NDI or acquisitions that do not require IOT**
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prior to production



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Initial Operational Test (IOT)

- **Required by law for major systems**
- **Conducted with production-representative systems**
- **Conducted under realistic conditions against the postulated threat**
- **Employs units/elements typical of those that will utilize/support the system**
- **System Contractor participation limited**
- **Provides data to support full-rate production decision**

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Follow-on Operational Test (FOT)

- **Normally conducted following a FRP decision to obtain missing information or to verify fixes in materiel, training, or concepts**
- **Tailored as needed**
- **FDT/E may be used for FOT**

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Force Development Test or Experimentation (FDT/E)

- **Conducted to evaluate training, logistics, doctrine, organization, or materiel**
- **Tests range from small, highly instrumented, full-scale experiments to large, less instrumented, combat scenario field tests**
- **Provides data to combat developers, testers, materiel developers, and materiel developers**

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Customer Test (CT)

- **Anything the customer wants**
- **Customer pays**
- **Customer approves concept**
- **OTC approves report**
- **Usually small low cost test**

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Other Service Testing

- **Joint Test and Evaluation (JT&E).** Addresses the fol to improve M&S and provide feedback to the joint operat acquisition communities:
 - technical or operational concepts,
 - interoperability,
 - testing methodologies, and
 - joint military mission capabilities
- **Multi-Service Operational Test and Evaluation (M OT&E** oriented on materiel acquisition for more than one systems that interface with equipment of another Service

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FOUO Expeditionary Testing

“This challenge is above all one of mindset... indeed, the requirement to fight for information, rather than fight with information.” - Serving a Nation at War

Testers must seek (and fight when necessary) for opportunities to gain data - we must influence Army processes like the TSARC to provide timely reso



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Expeditionary Testing Characteristics

- Any opportunity to gain critical system information in realistic user situations
 - Operational Assessments in Operational Theaters
 - CTC Rotations
 - Unit training exercises
- Strikes a balance between speed of gaining critical system information vs. control of operational “test” variables, quantity and scientific rigor of data
- Forward personnel ensure rapid deployment of task-organized test and operational assessment teams

The capability to deploy a task-organized test team to gather critical information on any system anywhere in the world!

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Forward Operational Assessment Team

Mission: The United States Army Test and Evaluation Command (ATEC) deploys Operational Assessment Teams to the U.S. Central Command area of responsibility in support of the Global War on Terrorism to conduct liaison with the MNC-I, CJTF-76, CFLCC and CENTCOM to plan, coordinate and integrate forward assessment, operational and developmental testing, evaluation, and experimentation of selected systems in order to provide essential information to Army leadership acquisition decision makers and the Warfighter (note: units depicted are a recent example).

13th SC(E) Tm



1CD Tm



FOA Fwd CP
Cp Victory



MNC-I Tm



25ID Tm



AVN Tm



ARCENT
Tm

**23 Soldiers
and
Civilians
Led by
CFLCC**
**179 day
Deployment**

CJTF76 Tm



Continuous Support in Combat Zone



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FOA Operations



Team Aviation



Team MND-North



Team COSCOM



Team MND-Baghdad



Team MNC-Iraq



- C2 in Baghdad
- Embedded teams with major commands
- Data sent back to CONUS
- Maintain liaison with MNC-I, CFLCC, CJTF76 HQs
- Weekly VTC w/ CG, OTC
- Weekly ATEC BUB
- Bi-weekly VTC w/ CG, ATEC

Team Kuwait



- Log spt and RSOI



Team Afghanistan



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Blow Torch

Hellfire Air-to-Ground Missile 114-N

Arcadia

Armored Security Vehicle (ASV)

Buffalo

Constant Hawk

CYCLOPS

Dragon Spike I

Electra

**Force XXI
Battle Command
Brigade & Below
Blue Force Tracker
(FBCB2 BFT)**

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~~FOUO~~ **FOA Assessments List (Selected)**



Husky



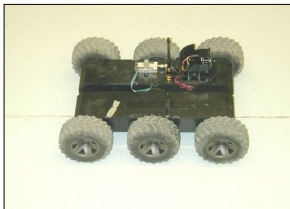
**HighlighteBody Ventilation
System**



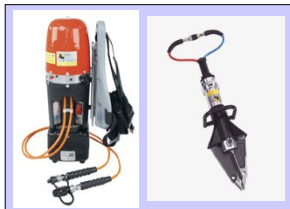
Triton



JNN



**Large Vehicle
Undercarriage Surveillance
System (LVUSS)**



MAKO Jaws



MastCam



**Modified Marine
Corps Transparent
Armor Gun Shield
(MCTAGS)**



Mini Jaws

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FOUO *FOA Assessments List (Selected)*



RG-31



UAS-T



**Sharp Edge
Mine Roller**

**Sharp Knife
Mine Roller**



**Standardized Integrated
Command Post System
Command Post Platform
(SICPS CPP)**



**Joint Precision Airdrop
System (JPADS)**



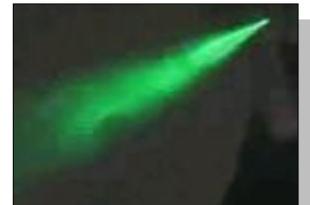
SWORDS



Forerunner



Ghost



Green Lasers

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Support to the Joint IED Defeat Organization

TECHNIQUES:

- **Electronic Warfare & Joint Spectrum Testing at Yuma Proving Ground, AZ**
- **National Training Center Joint IED Center of Excellence (JCOE)**
- **Forward Operational Assessments**
- **Reach-back Testing to support the Warfighter**



Warlock SSVJ



Gyrocam



Scan Eagle



MRAP 29

***ATEC - Chair of Joint
Test Board for
JIEDDO***



FOUO *Support to GWOT Lessons Learned*

- **JIEDDO, REF, AMC, PEO, ATEC integration with Soldiers and unit requirements reduces the material development cycle for the Warfighter**
- **System deployability and interoperability in Iraq/Afghanistan**
- **Maturation of Joint CREW Composite Squadron One (JCCS-1) improved theater's understanding of CREW interoperability issues**
 - **Navy EWO functions currently being performed by JCCS-1 will be transitioned to Army**
 - **2 x ATEC testers embedded in JCCS-1**
- **Linking theater leadership materiel issues back to CONUS takes advantage of all resources**
 - **Reach-back testing capabilities**
 - **Testing priorities and options**
- **Integration of Science and Technology, Soldiers, and Leaders to address specific system issues**
- **Value of technical expertise on the ground to help solve materiel challenges and assess soldier-generated initiatives**
- **ATEC Capabilities and Limitations reports provide critical information to units and leaders**

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FOUO OT 'Entrance Criteria'

- **Source: DA Pamphlet 73-1 - Table 6-3 and Appendix X**
- **33 Templates to be Considered/Tailored by the T&E WIPT**
- **Any Item Not Completed by OTRR #1 Becomes an Action Item**
- **See Overview of 33 Templates on Next Slide**

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DA Pamphlet 73-1 (Table 6-3) OT Entrance Criteria Matrix *

Test Planning & Documentation	Test Planning & Documentation	System Design & Performance	System Design & Performance	Test Assets & Support	Test Assets & Support
Schedule	Concept of Operations	Contractor Testing	Production Rep Articles	Test Team Training	Packaging, Handling & Transportation
Requirements	TEMP	Developmental Testing	Interoperability & Compatibility	Personnel	Support Agreements/ Contractor Support
AoA	OTA Test Plan	Live Fire Testing	Software Development	T & E Infrastructure	Threat Systems
STAR	Deficiency ID & Correction Process	System Performance	Safety Reviews & Certifications	M & S	Technical Data
Maintenance Concept	Security Planning	System Maturity	Deficiency Resolution	Support Equipment	CTSF Testing
	Configuration Management Plan			Sufficiency of Spares	Joint Interoperability Testing (if required)

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* **Templates in Appendix** ~~FOUO~~



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OT

Planning, Execution, and Reporting Considerations

- **Test scenario**
- **Test control**
- **Key coordination requirements**
- **Data authentication**
- **Operational Test Readiness Reviews (OTRRs)**
- **Pilot Test**
- **Suspension of testing**
- **Contractor involvement**
- **Official completion date**
- **Release of data**
- **Timeline**
- **OTC products**

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Test Scenario

**Test
Environment**

ISS

**Issues,
Criteria,
and
Measure
s**

**Focus on
Operational
Requirements**

TTPs

Doctrine

OMS/MP

**Threat and System Threat
Assessment Report (STAR)**

Blue Force

Generating Data

**Factors
and
Conditio
ns**

**Test
Control
Issues**

Consider Test Requirements

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FOUO **Test Control**

**Doctrin
e**

TTPs

**Focus on
Test Requirements**

**Test Environment
Issues, Criteria, and
Measures**

Factors and Conditions

Test Operations Issues

Test Control Issues

Data Management

OMS/MP

BLUEFOR

**Threat
Force and
STAR**

Consider Operational Requirements

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Key Coordination Requirements

- **Safety Release**
- **Human Use Committee**
- **Army T&E Executive and DOT&E:**
 - **Briefings**
 - **OTA TP approvals**

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FOUO Data Authentication

- **In every case, data produced by test must be authenticated prior to release - ordinarily done as part of quality control for small tests.**
- **For larger tests of complex systems, determine the need for a Data Authentication Group (DAG).**

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FOUO DAG Organization

- **Core members**
 - System Evaluator
 - Operational Tester
 - Combat Developer
 - Materiel Developer
 - Other members of the T&E WIPT
- **Extended membership**
 - DOT&E
 - ODUSA(TE)
 - HQDA
- **DAG chair will generally be from USAOTC**



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Operational Test Readiness Review (OTRR)

The OTRR is the forum in which the operational tester brings together all the representatives of agencies involved in the Operational or Force Development Test to determine overall readiness for test.

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OTRR Chairs

- **Commander, ATEC - ACAT I, ACAT II, MAISRC, and DOT&E T&E Oversight Sy**
- **Commander, OTC - ACAT III, FDT/E, and CT ***

*** unless delegated**

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FOUO OTRR Principal Attendees

- **Operational Tester**
- **System Evaluator**
- **Materiel Developer**
- **Combat Developer**
- **Training Developer**
- **Logistician**
- **Developmental Tester**
- **Org Providing Player Troops**
- **HQDA Staff Elements**
- **Host Installation**
- **Contractors**

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FOUO OTRR Areas of Concentration

MATDEV: previous test results; OTRS; Safety Release; software design stability; logistical support

CBTDEV: OTRS; logistic concept; OMS/MP; threat representation; test setting

TRNGDEV: test soldier training results; other special topics

DT TESTER: assessment of completed DT and system's progress against CTPs;
analysis of identified technical risks

OT TESTER: test organization; TRP/FORSCOM support; SEP/OTA TP/DTP; test schedule;
Pilot Test results; status of MOUs

System Evaluator: overall evaluation; critique of system readiness, TTPs, threat;
training readiness, & test readiness

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FOUO **OTRR Schedule**

- **Three OTRRs are essential for most OTs**
 - OTRR 1, T-270 - An action officer level review**
 - OTRR 2, T-60 - A review prior to resource deployment**
 - OTRR 3, T-1 - A review to determine readiness for re**
- **When necessary, the chair or any participant may request additional OTRRs be held**

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FOUO **OT Pilot Test**

A Pilot Test must always be conducted prior to the actual test to:

- ✓ **Assess the organization of the test team**
- ✓ **Validate the test scenario**
- ✓ **Confirm all planned control, data management,
and support procedures**

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FOUO Suspension of Operational Testing

- **Suspension may be recommended upon identification of a major problem or serious safety concern**
- **HQ OTC, the proponent, the evaluator, and the materiel developer are notified within 24 hours**
- **Officially suspended by CG, ATEC**
- **Test readiness reviews are conducted before restart**
- **If termination of OT is required, CG ATEC recommends termination to VCSA, if warranted**



Contractor Participation in OT

- **U.S. Code 10, Section 2399 prohibits system contractor participation in IOT for ACAT I and II.**
- **Participation is limited to the extent that the system contractor personnel are involved in the**
 - ✓ **Operation**
 - ✓ **Maintenance**
 - ✓ **Other support****when the system is deployed in combat.**
- **Policy meant to prevent system contractor manipulation or influences.**

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Official OT Completion Date

- **End Date (E-Date) = date when last record trial completed**
- **Milestone dates for event reporting begin from E-Date**

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FOUO Release of Data

- **Authenticated data (Level 3)**
 - **Authorized release to T&E WIPT, ODUSA(TE), TEO, & DOT&E**
- **Unauthenticated data (Levels 1, 2, & 3)**
 - **DAG and RAM Scoring conference members**
 - **PMs and MATDEVs**
- **Media requests referred to the appropriate PAO and security manager**
- **Classified data governed by AR 380-5**

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Timeline Chart

Requirement **Approval**

OTA TP	T - 120
DTP	T - 90
Start Test	T - Date
Last Record Trial	E + 00
Database Complete	E + 10
TR	E + 60
AOTR	E + 30

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FOUO **OT** **T&E Products**

- **Authenticated Test Data Bases**
- **Detailed Event Descriptions, Limitations, and Observations**
- **Analysis, Results, Conclusions, and Recommendations as required**

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OT Lessons Learned for the PM

- **Organize for T&E**
- **Agonize over system thresholds**
- **Understand the T&E policies & procedures**
- **Work closely with the OT Test Director/Officer**
- **Don't forget about operational suitability**
- **Ensure currency of system requirements documents**
- **Ensure DT verifies materiel readiness for IOT**
- **Prepare interfacing systems for your OT&E**
- **Manage software testing closely**
- **Track availability of test resources/support & personnel/facilities**

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OT Guidelines for PM & CBTDEV

**1 of
2**

- 1. Access to test site must be controlled to preclude actual or perceived influence in areas that might impact on validity of training and supportability assessments.**
- 2. Test data must be controlled to preclude premature release and improper interpretation.**
- 3. Acquisition team members will have access to unauthenticated data at the test site and will be provided copies of the authenticated data base.**
- 4. PMs will be provided unauthenticated level 3 or lower data if requested to troubleshoot significant safety problems.**

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IOT Guidelines for PM & CBTDEV

2 of 2

- 5. Plan for and support adequate operational testing to include early examinations of operational requirements to preclude discovery of major new problem(s) during the IOT.**
- 6. Operational testing is expensive and resource intensive and should not be source of major new problem(s) and should not be viewed as a pass/fail exercise**
- 7. Goal of IOT being more of a confirmatory exercise can only be realized by careful planning and early examination of operational considerations.**

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FOUO **Summary**

- **Operational tests are planned based on multiple inputs from user, evaluator, threat proponent, and materiel developer**
- **OT is conducted on representative systems with typical users in realistic environments with adherence to approved plans**
- **OT is reported to provide authenticated test data and/or findings to AEC for system evaluation/assessment or to other customers as required**

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Acknowledgement & Feedback

This module is a part of the T&E Managers Committee (TEMAC) T&E Refresher Course.

Request your feedback. Please contact -

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